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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,151	05/31/2001	Kyle M. Hanson	291958158US	9156
25096	7590	05/10/2005	EXAMINER	
PERKINS COIE LLP			WILKINS III, HARRY D	
PATENT-SEA			ART UNIT	
P.O. BOX 1247			PAPER NUMBER	
SEATTLE, WA 98111-1247			1742	

DATE MAILED: 05/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/872,151

Applicant(s)

HANSON ET AL.

Examiner

Harry D. Wilkins, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 and 54-86 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-51 and 54-86 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02/22, 03/24
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 1-86 is withdrawn in view of the newly discovered reference(s) to Wang. Rejections based on the newly cited reference(s) follow.

Rejection Status

2. The rejection of claim 48 in view of Wang has been withdrawn due to the absence of a teaching of an ion-membrane.

Priority

3. The effective filing of the subject matter in this Continuation-in-Part application is assumed to be 31 May 2001, the filing date of the instant application.

4. The Examiner respectfully requests Applicant to specifically point out any claimed subject matter which finds support in the parent application(s) that would cause the effective filing date of those claims to be considered different.

Claim Objections

5. Claim 12 is objected to because of the following informalities: "second" in line 3 should be "secondary". Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-51 and 54-86 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Woodruff et al (US 2001/0032788)

The applied reference has a common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. *The effective filing date of this reference is 14 February 2000, which is the first date upon which figures 6-10B and 12 appear.*

8. Wilson et al clearly anticipate the claimed invention. Please see figures 6-10B and 12.

9. Claims 1-51 and 54-86 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Wilson et al (US 2002/0008037 and US 6,660,137)

The applied reference has a common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing

under 37 CFR 1.131. *The effective filing date of this reference is 14 February 2000, which is the first date upon which figures 6-9 and 12-13 appear.*

Wilson et al clearly anticipate the claimed invention. Please see figures 6-9 and 12-13.

10. Claims 1-51 and 54-86 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Wilson et al (US 2002/0125141)

The applied reference has a common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. *The effective filing date of this reference is 24 May 2001, which is the first date upon which figures 9-14 appear.*

Wilson et al clearly anticipate the claimed invention. Please see figures 9-14.

11. Claims 1-51 and 54-86 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Wilson et al (US 2003/0038035)

The applied reference has a common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this

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application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. *The effective filing date of this reference is 30 May 2001, which is the first date upon which figures 6-9 and 12-13 appear.*

Wilson et al clearly anticipate the claimed invention. Please see figures 4-8B.

12. Claims 1-51 and 54-86 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Chen et al (US 6,565,729)

The applied reference has a common assignee and inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. *The effective filing date of this reference is 14 February 2000, which is the first date upon which figures 6-9 and 12-13 appear.*

Chen et al clearly anticipate the claimed invention. Please see figures 13-16 and 19-20.

13. Claim 1 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (US 6,391,166).

Wang anticipates the invention as claimed. Wang teaches (see figures 3A and 3B) a reactor apparatus for electrochemical processing of microelectronic workpieces including a reaction vessel, a first outlet (23) configured to introduce a primary flow into the reaction vessel, second and third outlets (22 and 21) configured to introduce

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secondary flows into the reaction vessel separate from the primary flow, and "a field shaping unit" in the reaction vessel, including cylindrical walls (101, 103, 105, 107 and 109), that receives the secondary flows and is configured to contain the secondary flow separate from the primary flow through a portion of the reaction vessel and having at least one electrode compartment containing an electrode (2 or 3). The "field shaping unit" (i.e.-cylindrical walls) is made from insulating material, and thus, is dielectric (see col. 7, lines 36-50).

Regarding claims 5-7, see also figures 20A and 20B.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claim 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Weaver et al (US 6,471,913).

The teachings of Wang are described above.

However, Wang is silent with respect to the apparatus including a primary flow guide as claimed.

Weaver et al teach (see figure 1B and col. 5, line 50 to col. 6, line 37) a primary flow guide as claimed which provides an electrolyte flow in a microelectronic workpiece apparatus that produces a substantially radially independent normal component of flow thereby resulting in uniform flow producing uniform mass flux at the wafer surface.

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Therefore, it would have been obvious to one of ordinary skill in the art to have added in the primary flow outlet, a primary flow guide as taught by Weaver et al because Weaver et al teach that it produces uniform electrolyte flow at the surface of the microelectronic wafer.

16. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Woodruff et al (US 2001/0032788).

The teachings of Wang are described above.

However, Wang is silent with respect to the apparatus including a virtual electrode unit as claimed.

Woodruff et al teach (see figure 6 and paragraphs 77 and 80) a virtual electrode as claimed which provides benefits by isolating the anodes from a primary electrolyte flow in a microelectronic workpiece apparatus.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a virtual electrode unit as claimed as taught by Woodruff et al because Woodruff et al teach that it provides controlled application of electric field at the surface of the microelectronic wafer.

Regarding claims 9-11, Woodruff et al teach a distributor as claimed (see figures 7A-7D). Therefore, it would have been obvious to one of ordinary skill in the art to have used a distributor as taught by Woodruff et al because the distributor provides easy distribution of electrolyte to multiple flow inlets.

17. Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Harada et al (US 5,700,127).

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The teachings of Wang are described above.

However, Wang is silent with respect to the apparatus including a cabinet, a head assembly and a transfer device as claimed.

Harada et al teach (see figure 1) an apparatus for treating semiconductor wafers that includes a cabinet, a head assembly for holding the wafers and a transfer device for handling the wafers.

Therefore, it would have been obvious to one of ordinary skill in the art to have used a conventional cabinet unit as claimed as taught by Harada et al because the cabinet unit provides controlled and automatic processing of the microelectronic wafer.

Regarding claim 19, see above regarding claim 5

18. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Harada et al (US 5,700,127) and further in view of Weaver et al (US 6,471,913).

The teachings of Wang, Harada et al and Weaver et al are described above.

Therefore, it would have been obvious to one of ordinary skill in the art to have added in the primary flow outlet, a primary flow guide as taught by Weaver et al because Weaver et al teach that it produces uniform electrolyte flow at the surface of the microelectronic wafer.

19. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Harada et al (US 5,700,127) and further in view of Woodruff et al (US 2001/0032788).

The teachings of Wang, Harada et al and Woodruff et al are described above.

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Regarding claim 20, it would have been obvious to one of ordinary skill in the art to have added a virtual electrode unit as claimed as taught by Woodruff et al because Woodruff et al teach that it provides controlled application of electric field at the surface of the microelectronic wafer.

Regarding claim 21, it would have been obvious to one of ordinary skill in the art to have used a distributor as taught by Woodruff et al because the distributor provides easy distribution of electrolyte to multiple flow inlets.

20. Claim 57, 60-62, 70 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al (US 5,700,127) in view of Wang (US 6,391,166).

The teachings of Harada et al and Wang are described above.

Harada et al does not teach a first outlet, at least one second outlet and a dielectric field shaping unit as claimed.

Wang teaches such a structure (see figures 3A and 3B).

Therefore, it would have been obvious to one of ordinary skill in the art to have added the structure of Wang to the semiconductor wafer processing apparatus of Harada et al because the device of Wang provides more uniform plating (see col. 2, lines 35-44).

Regarding claims 60-62 and 72, see above regarding claims 5-7.

Regarding claim 70, see figure 1 of Harada et al.

21. Claims 58, 59 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al (US 5,700,127) in view of Wang (US 6,391,166) and further in view of Weaver et al (US 6,471,913).

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The teachings of Wang, Harada et al and Weaver et al are described above.

Therefore, it would have been obvious to one of ordinary skill in the art to have added in the primary flow outlet, a primary flow guide as taught by Weaver et al because Weaver et al teach that it produces uniform electrolyte flow at the surface of the microelectronic wafer.

22. Claims 63, 64 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al (US 5,700,127) in view of Wang (US 6,391,166) and further in view of Woodruff et al (US 2001/0032788).

The teachings of Wang, Harada et al and Woodruff et al are described above.

Therefore, it would have been obvious to one of ordinary skill in the art to have used a distributor as taught by Woodruff et al because the distributor provides easy distribution of electrolyte to multiple flow inlets.

Examiner's Interpretation of the Prior Art

23. In the interest of reducing pendency and enhancing clarity, the Examiner would like to further discuss the claims. It is assumed by the Examiner that the rejections presented above based on the commonly owned references will be overcome through the proper means. In that instance, the Examiner wishes to make the record clear why certain claims are not rejected over the Wang reference.

a. Regarding claims 12-16, 22-47, 65-69 and 74-86, there is no motivation to use an interface member as claimed in the apparatus of Wang because the design of Wang requires the electrolyte to be in continuous contact with the workpiece. The diffuser ring of Wang does not constitute an interface member

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which prevents selected matter of the secondary flow from passing to the primary flow. The diffuser allows all matter to pass through.

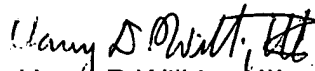
b. Regarding claims 48-51 and 54-56, there is no motivation to use an ion-exchange membrane as claimed in the apparatus of Wang because the design of Wang requires the electrolyte to be in continuous contact with the workpiece.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Harry D Wilkins, III
Examiner
Art Unit 1742

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